



# LOWER PLATTE SOUTH natural resources district

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Agenda Item #9

## Memorandum

**Date:** May 13, 2022  
**To:** Each Director  
**From:** Paul D. Zillig, General Manager  
**RE:** Water Resources Subcommittee Meeting Minutes.

The Water Resources Subcommittee met at 5:30pm on Thursday, May 12, 2022 in the NRD Large Conference Room. Subcommittee members participating included Susan Seacrest, Bob Andersen, Larry Ruth, Chelsea Johnson, and Ken Vogel. Others participating included Jonathan Mohr of LRE Water, Dale Schlautman, Naisi Dave, and Sydney Corcoran all of EA Engineering, Chris Witthuhn, Dick Ehrman, and myself.

Chair Seacrest opened the meeting and welcomed those in attendance.

The first item on the agenda was to consider a professional services contract with LRE Water to provide services regarding the NRD's Water Sustainability Fund approval for a 3-dimensional hydrogeologic framework project. Dick Ehrman reviewed his attached memo outlining the process to date, and the attached proposed contract. The Subcommittee discussed the benefits of the project and how it will improve the availability of our AEM data and make it easier to understand. The Subcommittee discussed that the estimated contract cost is \$290,000 and the grant has been approved for \$416,500. Ehrman reported that staff anticipates some additional work will be identified as LRE Water works on completing the items in the scope, staff will first need to request WSF approval of any additional work prior to NRD approval.

It was moved by Andersen, seconded by Chelsea Johnson, and unanimously approved by the Subcommittee to **recommend the Board of Directors approve the proposal from LRE Water for development of a 3-Dimensional Hydrogeologic Framework for LPSNRD up to a total project cost of \$416,500, subject to review by legal counsel.**

The next item on the agenda was to consider an agreement to install and operate a weather station north of Valparaiso. Ehrman explained that more accurate/timely rainfall data for the Dwight-Valparaiso-Brainard area would be beneficial for improved irrigation management. The best site would be located at the NRD's Red Cedar Wildlife Management Area located 6 miles northwest of Valparaiso. Ehrman reviewed the attached quote from the Nebraska State Climate Office, a map of the site, and a Memorandum of Agreement. Ehrman reported that the initial cost would be \$5,000 plus \$2,600 for the first year's operation and then \$2,600/year to maintain the site.

It was moved by Ruth, seconded by Andersen, and unanimously approved by the Subcommittee to **recommend the Board of Directors approve the Memorandum of Agreement with Board of Regents of the University of Nebraska/Nebraska State Climate Office for a Weather Monitoring Station at Red Cedar Wildlife Management Area and accept the quote of \$18,000 for the installation and 5-year annual operation of the weather station.**

The next item on the agenda was to consider a new contract with Midwest Laboratories for the analysis of water and soils. Ehrman reviewed the attached memo on the history and proposed future services needed. Ehrman expressed our satisfaction with the quality of the work done by Midwest Labs and pointed out that the increases in cost are typical for most all services obtained at this time.

It was moved by Chelsea Johnson, seconded by Vogel, and unanimously approved by the Subcommittee to **recommend that the Board of Directors enter into a professional services contract with Midwest Laboratories for the 5-year period of June 1, 2022 to May 31, 2027 for water and soil analysis at the prices given in the attached document, subject to review by legal counsel.**

The last action item on the agenda was to consider a final agreement to close out the landrights costs for the Upper Salt 3-A Rehabilitation Project. I reported that our agreement with the Vergith's (Lylester Ranch, LLC) calls for us to make final payments for the gate/driveway replacement and alternate access arrangements upon completion of the project. The only part of the project remaining is the additional upgrades being paid for by the Vergith's and completed by their contractor, Fulton Construction. These additional upgrades will likely not be completed until later this summer. It was decided that it would be in everyone's interest to all agree to a release and waiver so the NRD can pay our remaining costs and let Vergith & Fulton complete their project. There was enthusiastic agreement to this approach.

It was moved by Andersen, seconded by Vogel, and unanimously approved by the Subcommittee to **recommend the Board of Directors authorize the approval of the Agreement, Release, and Waiver with Lylester Ranch, LLC and Fulton Construction, Inc. for the Driveway replacement and access for the Upper Salt 3-A Rehabilitation Project, pending legal counsel review.**

The next item was a report by Dale Schlautman of EA Engineering on the Draft Nitrate Verification Reports for Ashland and Raymond. A summary for each report is attached. The Subcommittee discussed the results and that the next step will be to have public meetings at each community to further discuss the reports. The NRD Board will need to consider future designation of these areas as either Phase 1 or Phase 2 as per our Groundwater Management Plan and the Groundwater Rules & Regulations.

Staff then reported that next meeting the Subcommittee will need to review and consider a Groundwater Variance request for the Ragusa/Hladik property in the Dwight-Valparaiso-Brainard Special Management Area south of Valparaiso.

There being no additional business the meeting adjourned at 7:05 pm.

PDZ/pz

cc: Steve Seglin & Corey Wasserburger

## Memorandum

**Date:** May 12, 2022  
**To:** Water Resources Subcommittee  
**From:** Dick Ehrman, Water Resources Coordinator  
**Subject:** Proposal from LRE Water for LPSNRD's 3-Dimensional Hydrogeologic Framework Project

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In 2021, LPSNRD applied and was approved for a grant through the Water Sustainability Fund (WSF) for a project entitled "LPSNRD 3-Dimensional Hydrogeologic Framework." WSF granted LPSNRD a total of \$247,500, which is required to have a match of \$165,000 of NRD funds (60% WSF, 40% LPSNRD) for a total allowable project cost of \$416,500. This total has been included in the first draft of the 2023 LRIP. This project is intended to utilize the extensive airborne electromagnetic (AEM) data as well as all other available geologic information to construct a 3-dimensional framework of the entire NRD, which will allow visualization and analysis of the groundwater and geologic resources of the District, and will also prepare the AEM data for inclusion in future numerical groundwater modeling efforts.

LPSNRD solicited qualifications for this project and was provided the attached proposal by LRE Water. LRE has successfully worked with the Lower Elkhorn, Papio-Missouri River, and Lower Platte North NRDs on similar projects. LRE's initial cost estimate for the project is \$290,000, which could potentially allow LPSNRD to perform additional activities under this project going forward, of course assuming that any activities would be acceptable under WSF requirements.

### STAFF RECOMMENDED MOTION

The Water Resources Subcommittee recommends that the Board of Directors approve the proposal from LRE Water for development of a 3-Dimensional Hydrogeologic Framework for LPSNRD up to a total project cost of \$416,500, subject to review by legal counsel.

Enclosures  
Pc: Water Resources Subcommittee File



May 11, 2022

Dick Ehrman, Water Resources Coordinator  
Lower Platte South Natural Resources District  
P.O. Box 83581  
Lincoln, NE 68501-3581

RE: Proposal - 3D Hydrogeologic Framework  
Lower Platte South Natural Resources District

Dear Mr. Ehrman,

LRE Water is pleased to provide the Lower Platte South Natural Resources District (LPSNRD) with the following scope of work, fee, and schedule (proposal) to complete the 3D airborne electromagnetic (AEM) Hydrogeologic Framework (3D Framework) and Hydrogeologic Assessment Report (Assessment Report).

Our proposal is based on LPSNRD's Request for Proposal; LRE Water's scope of work outlined on our Statement of Qualifications submitted on April 22, 2022; and, LRE's previous experience developing 3D frameworks and completing assessment reports for the Lower Elkhorn NRD (LENRD), Papio-Missouri River NRD (PMRNRD), and the Lower Platte North NRD (LPNNRD). In addition to our the experience, LRE Water will subcontract Aqua Geo Frameworks (AGF) who will provide their AEM expertise to enhance the 3D Framework development. AGF has been an integral partner with LPSNRD in collecting and process the AEM data, and will work closely with LRE and LPSNRD throughout this project.

### **PROJECT BACKGROUND AND APROACH**

A 3D Framework utilizing AEM has been completed for the LENRD, LPNNRD, and PMRNRD using the LRE Water team's developed and approved process that has been accepted by the Nebraska Department of Natural Resources (NeDNR). In addition to the AEM-based portion of the 3D Framework, LRE Water completed a detailed hydrogeologic

assessment using all available geologic logs from the NeDNR and University of Nebraska – Conservation Survey Division’s (UNL-CSD) wells and test holes databases for LENRD, PMRNRD, and Nemaha Natural Resources District.

The same processes and deliverables described above will be provided to the LPSNRD to meet the 3D Framework objectives. The 3D Framework will provide the LPSNRD staff with a visual model of the 3D Framework utilizing a 3D geologic modeling software package (Leapfrog Works). A user-friendly and free model viewer (Leapfrog Viewer), along with the Assessment Report will be provided to the LPSNRD. This will allow LPSNRD staff to visually display the 3D model from Leapfrog and the Assessment Report, which can be shared with the Board of Directors (Board), neighboring NRDs, NeDNR, citizens, agricultural producers, businesses, and other District constituents. The 3D Framework will greatly enhance the ability to manage water resources in a sustainable and efficient manner.

Once complete, LPSNRD will have the capability to:

- 1) Evaluate well development requests and site new monitoring wells more efficiently;
- 2) Establish a stronger understanding of aquifer characteristics such as recharge areas and water bearing layers;
- 3) Complete vulnerability assessments and identify locations in greater need of best management practices;
- 4) Better define hydrologically connected surface and groundwater;
- 5) Improve collaboration with neighboring NRDs and NeDNR, regardless of political boundaries; and,
- 6) Produce numerical model layer files from the 3D Framework that fit into ‘flow modeling’ software, such as MODFLOW, for use during the next phase of data development and utilization.

Comprehensiveness in the application of the AEM data into the LPSNRD’s 3D Framework, that is also consistent with the other Basin NRDs, is the foundation of the LRE Water team’s high-level approach. Methodologies have been established to ensure a seamless application of datasets between political boundaries with the software used to develop the 3D Framework.



To meet the objectives of the 3D Framework and Assessment Report, LRE Water is proposing the following scope of work.

## **I. SCOPE OF SERVICES**

To complete the 3D Framework and Assessment Report, the LRE Water team will implement a similar and proven approach, that has been supported and accepted by the NeDNR in 2019 through 2021 for the LENRD's 3D Framework and groundwater modeling project, and the 3D Frameworks created for PMRNRD and LPNNRD

Using the same methodology that was applied to develop these will provide LPSNRD with a consistent and comprehensive assessment and deliverable that will include the most recent data and make it useable between NRD boundaries.

### **Phase 1 – Coordinate Project and Conduct Meetings**

- Coordinate and communicate with LPSNRD, NeDNR staff throughout the 3D Framework and Assessment Report to ensure objectives are met.
- Collaborate with AGF on critical phases of the 3D Framework development.
- Schedule and attend in person and/or virtual meetings with LPSNRD and NeDNR staff and the Board, as necessary.
- Provide updates at critical points in the Project.

### **Phase 2 – Obtain and Evaluate Existing Datasets**

The purpose of Phase 2 will be to compile and evaluate existing hydrogeologic datasets including the following:

- Obtain data within the Project area and an approximately 5-mile buffer analysis area outside of the LPSNRD boundary, and include AEM and geologic log data within this buffer to assure accurate data interpolation at the LPSNRD boundary.
- Download and use processed AEM data provided by AGF, ENWRA, USGS, and the Nebraska GeoCloud, while incorporating geologic logs to refine the top of the bedrock surface, to create the 3D Framework. Resistivity data will



be used as-is and not reinterpreted from the downloaded deliverables, except for potentially select reprocessed datasets by AGF (i.e., Firth and Sprague block flights).

- Obtain and evaluate all available geologic logs from the NeDNR wells and UNL-CSD test hole logs databases, in addition to available AEM data. The well log data will be used in Phase 3 to refine the hydrostratigraphic contact between the unconsolidated materials and top of bedrock.
- Obtain and review other available and relevant hydrogeologic studies from the LPSNRD, USGS, NeDNR, UNL-CSD, neighboring NRDs, and others.

### **Phase 3 – Complete Geospatial Analysis for Hydrogeologic Assessment Report**

The purpose of Phase 3 will be to complete a spatial analysis of datasets that are critical to generating the geologic layers used in the geologic model of the 3D Framework and in the Assessment Report that will characterize the hydrogeology within the LPSNRD. This phase will include the following:

- Refine the contact between the unconsolidated and bedrock using available geologic logs from the NeDNR and UNL-CSD wells and test hole logs as follows:
  - Interpolate top-of-bedrock elevation data and create a gridded surface using ArcGIS for the top of the uppermost bedrock, or contact between the uppermost bedrock and the overlying unconsolidated. This surface will be used to refine the Framework by creating the two Geologic Model units described below in Leapfrog (unconsolidated and bedrock) to constrain the AEM data analysis and for future MODFLOW parameterization in the unconsolidated material.
  - Construct 20 to 25 hydrogeologic cross sections for the LPSNRD showing the lithology from well logs for a visual comparison to the AEM profiles along select flight lines. The locations of the cross sections will be discussed with the LPSNRD staff before they are constructed. The cross sections will also assist in any future MODFLOW parameterization and calibration by providing another source of geologic data to review.

- Ensure the analysis is consistent with methods used to complete similar work for adjoining NRDs to provide as consistent a final product as possible, where applicable. If differences exist, a summary of deviations from previous methods will be noted in appropriate documentation.
- Create raster surfaces of the unconsolidated material using ArcGIS Spatial Analyst for a Assessment Report and GIS Geodatabase deliverable.

#### **Phase 4 – Reinversion of Select AEM Blocks (AGF)**

AGF, as an integral partner with LRE Water on this Project, will provide the following services to enhance the 3D Framework development. The following include a high-level summary of the services AGF proposes. Additional details are in Attachment A in LRE's SOQ.

- Reinversion of Legacy Frequency Domain HEM Data: Select AEM data, particularly near Sprague and Firth, were acquired using older frequency-domain electromagnetic technology. The development of the Time-Domain Electromagnetic (TDEM) helicopter systems, like the SkyTEM system, allow enhanced imaging deeper and through the glacial till. Using relationships between legacy HEM and adjacent TDEM, AGF would be able to reinvert legacy data from the Firth and Sprague Blocks. Due to the experience and procedures that AGF has developed, the reinversion work would be completed at a minimal cost compared with the original acquisition and processing.
- Nebraska GeoCloud Products and Upload: AGF was involved from the beginning stages of the development of the Nebraska GeoCloud and was a critical part in the launching of the Nebraska GeoCloud. AGF has an excellent working knowledge of the Nebraska GeoCloud and will provide data conversions and data standardization of products produced from the LRE Water team that will be uploaded to the Nebraska GeoCloud.
- Additional services AGF could provide, that may be outside the scope of the Project are provided below. LRE Water and AGF can discuss these with





LPSNRD in more detail if the need arises. These additional services might include:

- Access to Additional Data in LPSNRD: AGF has a unique ability to provide additional AEM data within the LPSNRD that were previously acquired by other clients for a reduced price. As the trusted AEM service provider in Nebraska, AGF has acquired additional data that can be purchased by LPSNRD as required to fulfill the mapping mission. These data are mostly within Cass County and in areas that have limited existing AEM coverage from the previously flown AEM surveys in LPSNRD.
- Ground-Based Geophysical Systems: Much of LPSNRD has been flown with AEM. However, select areas (on the scale of 1-mile sections) could not be flown with AEM due to infrastructure or could benefit from finer-scale “infill” characterization compared to the AEM line spacing. To meet this potential requirement, AGF has an alliance with Collier Geophysical to provide ground-based geophysical methods as an alternative to drilling alone. One example, AgTEM, a pulled Transient Electromagnetic (TEM) system deployed by Collier, has the unique ability to infill at the approximate 1-mile section-sized survey area versus the larger AEM survey areas. The AGF / Collier Geophysical alliance also allows access to other traditional ground-based geophysics.

#### **Phase 5 – Develop 3D Framework and Provide Leapfrog Viewer**

LRE Water will develop the 3D Framework using existing AEM data to create a 3D geologic and resistivity model using Leapfrog Works, a powerful geological modeling software package from Seequent (Bentley Systems).

LRE Water’s methodology to create a 3D Model in Leapfrog, developed during similar 3D Framework projects, identified the potential for discrepancies and the inherent differences between the AEM and the geologic logs (e.g., data spacing, vertical resolution, and electrical similarities with underlying bedrock), and after discussions with project stakeholders, it was decided to approach the 3D Framework development as follows:



- Use geologic logs from wells and test holes to define the bedrock surface, or bottom of the Principal Aquifer; and,
- Use AEM data to define the hydrostratigraphy and AEM resistivity zones (or hydraulic conductivity zones) of the unconsolidated materials above bedrock.

This method has proven critical since the two datasets provide different information:

1. The AEM data provides quantitative values of electrical resistivity (which represent different subsurface materials such as clay, sands, and gravels) and the associated aquifer hydraulic conductivity; and,
2. The geologic logs represent qualitative interpretations of different geologic materials and provide bedrock depths to the nearest foot.

In general, a five-step process will be used to develop the 3D Framework using Leapfrog:

1. Import the AEM resistivity data into Leapfrog, represented as “boreholes”.
2. Interpolate the AEM resistivity data and create a 3D Numeric Model (not MODFLOW) with eight assigned AEM resistivity ranges and corresponding hydraulic conductivity zones.
3. Create a 3D Geologic Model that will result in two solid units representing:
  - The unconsolidated material (from the ground surface to the top of the uppermost bedrock surface); and,
  - The bedrock (from the top of bedrock surface to an arbitrary elevation).
4. Create a 3D Combined Model to represent the eight AEM resistivity zones for the two geologic units (unconsolidated and bedrock) independently. When future groundwater flow modeling is needed, the 3D Combined Model can be exported to MODFLOW and include the eight resistivity or hydraulic conductivity zones.
5. Export the 3D Leapfrog model to a Leapfrog Viewer model for LPSNRD to use the model data using the free, Leapfrog Viewer application. The Leapfrog Viewer file will include all AEM data (as boreholes), interpolated



AEM surfaces/volumes, DEM, bedrock surface, well and test hole borehole lithology (e.g., sand, clay, bedrock), and a reference map.

The goal in developing the 3D MODFLOW Model in Leapfrog is to have a hydrogeologic model that can be used to construct a grid (i.e., series of rows, columns and layers that define a unique set of grid blocks or cells) for the development of a future numerical groundwater flow model in MODFLOW. Although a MODFLOW model is not included in this Project, the 3D Framework will be developed considering a future potential groundwater flow model for the LPSNRD.

AEM data from adjacent NRDs will be included in the Leapfrog 3D Framework model to assure seamless integration with models previously developed in Leapfrog. This integration with neighboring NRD models means that future MODFLOW model grid development and merging of subsequent MODFLOW models will have seamless transitions at the model boundaries with no abrupt changes in model layering or hydraulic conductivity zone IDs.

#### **Phase 6 – Complete Hydrogeologic Assessment Report and Provide Mapping Files**

In addition to the AEM deliverable described under Phase 5, LPSNRD will also receive an Assessment Report, which further evaluates the hydrogeology using only the geologic descriptions on well logs and test hole logs (e.g., sand, gravel, clay). The Assessment Report and associated deliverables will include:

- A robust evaluation of the entire LPSNRD that includes a summary of the hydrogeologic setting, principal aquifer characteristics, aquifer extents, key hydrostratigraphic surfaces using borehole lithology from all the test holes and wells logs; and, high-capacity well development potential (risk map).
- Approximately 20 to 30 figures, in addition to 20 to 25 hydrogeologic cross sections, showing the lithology of each well log in comparison to the AEM profiles along flight lines.
- Maps of particular interest will be total saturated aquifer materials, GIS modeled qualitative groundwater resource developments areas, qualitative groundwater resource developments areas, and potential aquifer recharge areas.

- Final GIS data and mapping files in ESRI Geodatabase and/or hard copy Assessment Report deliverable format. The Assessment Report deliverable can be used in conjunction with the 3D Framework and 3D model software (Leapfrog Viewer) to have the most up to date robust formats to assist the LPSNRD with water management decisions.
- The ESRI Geodatabase will allow the LPSNRD efficient access and use of the hydrogeologic GIS layers created for the Assessment Report. Additionally, the layers will be provided in one consolidated map document with layer symbologies set the same as the Assessment Report figures.
- Data products in a format consistent with Nebraska GeoCloud standards and guidelines.

#### **Phase 7 – Provide Recommendations for Future Work**

The purpose of this phase is to include recommendations for future work based on the findings of the 3D Framework and Assessment Report and identified data gaps. Recommendations may include, but not be limited to:

- Additional AEM or surface geophysics,
- Test hole drilling locations,
- Aquifer pumping tests to refine aquifer extents and aquifer parameters,
- Installing monitoring wells,
- Additional studies or planning efforts, such as wellhead protection or Drinking Water Protection Management Plans, that would benefit community water systems that are more vulnerable to contamination.

LRE will also work directly with LPSNRD staff to identify potential funding sources that would support, or leverage District funding, such as the Water Sustainability Fund, NDEE's Source Water Protection Program or 319 Program, Nebraska Environmental Trust, and others.



**I. TIME REQUIRED**

The LRE Team can begin the 3D Framework and Assessment Report project immediately after authorization, and have it completed in 10 to 12 months. An approximate schedule is provided in Table 1.

**II. FEE AND PAYMENT**

We believe the services described above can be accomplished for \$290,000..3D Framework and Assessment Report outlined above is \$. A summary of the cost estimate is provided below and a detailed breakdown of staff hourly rates and fees for each phase are provided in Table 2:

Phase No.	Phase Name	LRE Water	AGF	Grand Total
1	Project Management and Meetings	\$32,000	\$0	\$32,000
2	Obtain and Evaluate Existing Datasets	\$58,000	\$0	\$58,000
3	Complete Geospatial Analysis for Hydrogeologic Assessment Report	\$48,000	\$0	\$48,000
4	Reinversion of Select AEM Blocks (AGF)	\$0	\$37,000	\$37,000
5	Develop 3D Framework and Provide Leapfrog Viewer	\$37,000	\$18,000	\$55,000
6	Complete Hydrogeologic Assessment Report and Provide Mapping Files	\$42,000	\$10,000	\$52,000
7	Provide Recommendations for Future Work	\$8,000	\$0	\$8,000
<b>GRAND TOTALS</b>		<b>\$225,000</b>	<b>\$65,000</b>	<b>\$290,000</b>

Invoices are submitted monthly for time and expenses incurred. Terms of payment are net 30 days. Overdue accounts are subject to an interest charge of 1.5 percent per month and services will stop whenever payment is overdue more than 75 days. Terms of payment are net 30 days. Overdue accounts are subject to an interest charge of 1.5 percent per month and services will stop whenever payment is overdue more than 75 days.

Payments for our services, like other professional services, are based on the actual time spent on your behalf and are measured by standard hourly rates in effect at the time the services are performed. For those assigned to your team, those rates currently range from \$200–\$275 for principals; \$100–\$260 for engineers and hydrologists; and \$75–\$140 for data processing, technicians and IT support. Individuals are assigned to a project based on the type of services involved and the experience and expertise of the individual.



Routine expenses such as telephone and copies are included in the rates above. Outside expenses such as laboratory analysis, obtaining aerial photos, or other special services incurred directly in connection with the project are billed at cost plus 5 percent to cover handling and administration. Reimbursable expenses billed at cost include airfares, automobile rental, and other travel or per diem costs. Subconsultants to LRE are billed at cost plus 10 percent.

The scope described under Part I represents our estimate of the services required based on the information provided. As the project proceeds and additional facts are discovered, it may be necessary to perform additional services and some items described may not be needed. For these reasons, we can provide only an estimate of the time and cost of completing the services.

### **III. LIMITATION OF LIABILITY AND CONSEQUENTIAL DAMAGES**

In recognition of the relative risks and benefits of the project to both LPSNRD and LRE, the risks have been allocated such that LPSNRD agrees, to the fullest extent permitted by law, to limit the liability of LRE and its officers, employees, and sub-consultants, to LPSNRD and all of LPSNRD's contractors and consultants, for any and all claims, losses, costs, damages of any nature whatsoever; or claims expenses from any cause or causes, including attorneys' fees and costs and expert witness fees and costs, so that the total aggregate liability of LRE to LPSNRD shall not exceed the total amount of \$100,000 or the total fees billed to this project, whichever is less. It is intended that this limitation apply to any and all liability or cause of action however alleged or arising, unless otherwise prohibited by law.

Notwithstanding anything to the contrary herein, in no event shall either Party hereto be liable to the other for any special, indirect, incidental, exemplary, or punitive damages, including without limitation, loss of profits, loss of business opportunity or loss of prospective revenue, arising out of this Agreement, however same may be caused. This Section shall survive the expiration or termination of this Agreement.

### **IV. SPECIAL SERVICES**

Services in addition to those described under Part I will be performed or obtained for the client's account upon request and approval at rates currently in effect. Special services may include, but are not limited to, expert testimony, appearances at public meetings, soil investigations, topographic and land surveys, including



establishment of boundaries, well drilling, well and aquifer testing, electric logging, water quality sampling and analysis, preparation of construction drawings and specifications, material testing, data management, environmental permitting, and regulatory compliance.

## VI. INSURANCE

LRE maintains the following insurance:

1. Commercial General Liability
2. Automobile Liability
3. Workers' Compensation and Employer's Liability
4. Professional Liability Insurance

Acceptance of this proposal and authorization to proceed with the services can be indicated by signing one copy and returning it to us for our files. The terms of this proposal will be honored for a period of 30 days.

We look forward to discussing this proposal with you and if you have any questions or concerns about the services offered in the proposal please contact Dave Hume at (612) 805-0919 or at [Dave.Hume@LREwater.com](mailto:Dave.Hume@LREwater.com) if you have questions on what we have presented or if there is anything we can do to assist.

Thank you for providing us the opportunity to present this proposal to LPSNRD.

Sincerely,

LRE WATER

Dave Hume, PG (NE # 0186)  
VP Midwest Operations

For: \_\_\_\_\_  
Contracting Agency

William H. Fronczak, P.E., Esq.  
Vice President – Risk Management

By: \_\_\_\_\_  
Authorized Signature/Title

Date



Dick Ehrman  
May 11, 2022  
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Cc: Jared Abraham – AGF  
Mike Plante – LRE  
Roscoe Sopiwnik - LRE  
Jonathan Mohr – LRE

WHF/DSH

DRAFT





**Table 2  
Schedule  
3D Hydrogeologic Framework and Assessment  
Lower Platte South NRD**

Phase No.	Phase Name	2022						2023					
		June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May
PHASE 1:	Project Management and Meetings	X		X			X			X			X
PHASE 2:	Obtain and Evaluate Existing Datasets												
PHASE 3:	Complete Geospatial Analysis for Hydrogeologic Assessment Report												
PHASE 4:	Reinversion of Select AEM Blocks (AGF)												
PHASE 5:	Develop 3D Framework and Provide Leapfrog Viewer												
PHASE 6:	Complete Hydrogeologic Assessment Report and Provide Mapping Files												
PHASE 7:	Provide Recommendations for Future Work												

X = quarterly progress meetings and memorandums

**Table 1**  
**LRE Water and AGF Rates and Cost Estimate**  
**3D Hydrogeologic Framework and Assessment Report**  
**Lower Platte South NRD**

**DRAFT**

LRE WATER RATES	
Staff	Rate
Hume	\$230 /hr
Plante	\$210 /hr
Sopiwnik	\$175 /hr
Mohr	\$180 /hr

AGF RATES	
Staff	Rate
Abraham	\$180 /hr
Asch	\$180 /hr
AGF Staff	\$100 /hr

**PHASE 1: Project Management and Meetings**

LRE Water			
Personal	Hours	Rate	Total Cost
Hume	100	\$230 /hr.	\$23,000
Plante		\$210 /hr.	\$0
Sopiwnik		\$175 /hr.	\$0
Mohr	50	\$180 /hr.	\$9,000
Total LRE Labor			\$32,000

AGF			
Personnel	Hours	Rate	Total Cost
Abraham		\$180 /hr.	\$0
Asch		\$180 /hr.	\$0
AGF Staff		\$100 /hr	\$0
Total AGF Labor			\$0

**PHASE 2: Obtain and Evaluate Existing Datasets**

LRE Water			
Personnel	Hours	Rate	Total Cost
Hume	10	\$230 /hr.	\$2,300
Plante	80	\$210 /hr.	\$16,800
Sopiwnik	220	\$175 /hr.	\$38,500
Mohr		\$0 /hr.	\$0
Total LRE Labor			\$57,600

AGF			
Personnel	Hours	Rate	Total Cost
Abraham		\$180 /hr.	\$0
Asch		\$180 /hr.	\$0
AGF Staff		\$100 /hr	\$0
Total AGF Labor			\$0

**PHASE 3: Complete Geospatial Analysis for Hydrogeologic Assessment Report**

LRE Water			
Personnel	Hours	Rate	Total Cost
Hume	10	\$230 /hr.	\$2,300
Plante	80	\$210 /hr.	\$16,800
Sopiwnik	170	\$175 /hr.	\$29,750
Mohr		\$180 /hr.	\$0
Total LRE Labor			\$48,850

AGF			
Personnel	Hours	Rate	Total Cost
Abraham		\$180 /hr.	\$0
Asch		\$180 /hr.	\$0
AGF Staff		\$100 /hr	\$0
Total AGF Labor			\$0

**PHASE 4: Reinversion of Select AEM Blocks (AGF)**

LRE Water			
Personnel	Hours	Rate	Total Cost
Hume		\$230 /hr.	\$0
Plante		\$210 /hr.	\$0
Sopiwnik		\$175 /hr.	\$0
Mohr		\$180 /hr.	\$0
Total LRE Labor			\$0

AGF			
Reinversion Area	Total line-km	Rate	Total Cost
Firth Area	398	\$25 /hr.	\$9,950
Sprague Area	1084	\$25 /hr.	\$27,100
Total AGF Labor			\$37,050

**Table 1**  
**LRE Water and AGF Rates and Cost Estimate**  
**3D Hydrogeologic Framework and Assessment Report**  
**Lower Platte South NRD**

**DRAFT**

<b>PHASE 5: Develop 3D Framework and Provide Leapfrog Viewer</b>					
<i>LRE Water</i>				<i>AGF</i>	
Personnel	Hours	Rate	Total Cost	Personnel	Total Cost
Hume	10	\$230 /hr.	\$2,300	Abraham	\$9,000
Plante	150	\$210 /hr.	\$31,500	Asch	\$9,000
Sopwinik	20	\$175 /hr.	\$3,500	AGF Staff	\$0
Mohr		\$180 /hr.	\$0	Total AGF Labor	
			Total LRE Labor		\$18,000
					\$37,300

<b>PHASE 6: Complete Hydrogeologic Assessment Report and Provide Mapping Files</b>					
<i>LRE Water</i>				<i>AGF</i>	
Personnel	Hours	Rate	Total Cost	Personnel	Total Cost
Hume	20	\$230 /hr.	\$4,600	Abraham	\$0
Plante	40	\$210 /hr.	\$8,400	Asch	\$0
Sopwinik	140	\$175 /hr.	\$24,500	AGF Staff	\$10,000
Mohr	20	\$180 /hr.	\$3,600	Total AGF Labor	
			Total LRE Labor		\$10,000
					\$41,100

<b>PHASE 7: Provide Recommendations for Future Work</b>					
<i>LRE Water</i>				<i>AGF</i>	
Personnel	Hours	Rate	Total Cost	Personnel	Total Cost
Hume	10	\$230 /hr.	\$2,300	Abraham	\$0
Plante	10	\$210 /hr.	\$2,100	Asch	\$0
Sopwinik	10	\$175 /hr.	\$1,750	AGF Staff	\$0
Mohr	10	\$180 /hr.	\$1,800	Total AGF Labor	
			Total LRE Labor		\$0
					\$7,950

**Summary**

Phase No.	Phase Name	LRE Water	AGF	Grand Total
PHASE 1:	Project Management and Meetings	\$32,000	\$0	\$32,000
PHASE 2:	Obtain and Evaluate Existing Datasets	\$57,600	\$0	\$57,600
PHASE 3:	Complete Geospatial Analysis for Hydrogeologic Assessment Report	\$48,850	\$0	\$48,850
PHASE 4:	Reinversion of Select AEM Blocks (AGF)	\$0	\$37,050	\$37,050
PHASE 5:	Develop 3D Framework and Provide Leapfrog Viewer	\$37,300	\$18,000	\$55,300
PHASE 6:	Complete Hydrogeologic Assessment Report and Provide Mapping Files	\$41,100	\$10,000	\$51,100
PHASE 7:	Provide Recommendations for Future Work	\$7,950	\$0	\$7,950
<b>TOTALS</b>		\$224,800	\$65,050	\$289,850

# QUOTE



Quote Number	Date	Valid Until
20220506023	2022-05-06	2022-06-30

Quote from	Quote to
Dr. Martha Shulski	Paul Zillig
Director	General Manager
Nebraska State Climate Office	3125 Portia Street
3310 Holdrege Street	Lincoln, NE 68521
153B Hardin Hall	ofc. 402-476-2729
Lincoln, NE 68583-0931	
mshulski3@unl.edu	pzillig@psnrd.org

Code	Quantity	Description	Unit Price	Line Total
nsc-mesonet	Initialization	Tier 2 Weather Monitoring Valparaiso 6NW	\$18,500.00	\$0.00
nsc-mesonet	5 years	Tier 2 Weather Monitoring Valparaiso 6NW	\$2,600.00	\$13,000.00
		Initial Fee of \$18,500.00 waived.		
		First year invoiced \$2,600/year, after which in Dec for preceeding years		
nsc-pluvio2	1 time fee	Upgrade to all-season weighing precipitation gauge	\$5,000.00	\$5,000.00
		<b>TOTAL</b>		<b>\$18,000.00</b>

Accepted by -

(signature)

(printed)

then mail or scan and email to:

Nebraska State Climate Office  
 c/o Dr. Martha Shulski  
 3310 Holdrege Street, Suite 153B  
 Lincoln, NE 68583-0931  
 scooper6@unl.edu

# Red Cedar Wildlife Management Area, Saunders County, NE



Map Updated: January 2022 - LPSNRD, edr

-  Red Cedar WMA
-  Boat Ramp
-  Parking
-  Toilets

0 500 1,000 Feet

## MEMORANDUM OF AGREEMENT

This **MEMORANDUM OF AGREEMENT** (“**MOU**”) is entered into this **18<sup>th</sup>** day of **May, 2022**, by and between **Lower Platte South Natural Resources District** having their principal address as **3125 Portia Street, Lincoln, NE 68521** (“**Owner**”) and **THE BOARD OF REGENTS OF THE UNIVERSITY OF NEBRASKA**, a public corporate body and agency of the State of Nebraska, and governing body of the University of Nebraska-Lincoln on behalf of the Nebraska State Climate Office (“**NSCO**”).

**1. Premises Description.** The Owner is the legal owner of the real property(s) described on Exhibit B attached hereto and incorporated herein by reference (the “**Premises**”).

**2. NSCO Use of Premises.** The Owner and NSCO have agreed upon an area or areas no larger than twenty (20) meters by twenty (20) meters on each Premises for use by NSCO for a **Weather Monitoring Area or Areas**. NSCO has already located an automated weather monitoring equipment with a fence around the Weather Monitoring Area(s) that is less than twenty (20) meters by twenty (20) meters, with the purpose of protecting the weather station equipment at each location. Nothing herein shall be construed as to grant NSCO an easement or any legal title or right to use the property, other than the specific use granted herein. All parties acknowledge that the use pursuant to this agreement is permissive, and shall not, under any circumstances, ripen into any legal title or possessory interest. NSCO shall use the property in such way as to minimize any impact on, or interference with, the property uses of the Owner, and/or Owner’s lessee.

**3. Access.** The Owner agrees to allow NSCO, its employees, agents and contractors access to the Weather Monitoring Area. The Owner agrees to not expressly grant unauthorized individuals’ permission to access the Weather Monitoring Area. However, nothing herein shall be construed as to impose any duty or responsibility on Owner, to NSCO or any other person or entity, to secure, monitor or in any way supervise or protect the Weather Monitoring Area and equipment. Any and all risk of loss to the Weather Monitoring equipment is assumed and shall be borne by NSCO. Owner assumes no liability for any damage or loss to the Weather Monitoring Area or equipment, unless directly caused by the intentional act of Owner or its employees.

**4. Term of MOU.** The term of this MOU shall be from the signature date until the 31<sup>st</sup> day of December, 2027, unless so amended. This MOU shall automatically renew for successive twenty-year terms unless either party provides ninety (90) days written notice of its intent to terminate the MOU.

**5. Future Easements.** No easements will be necessary for the installation of utility lines or electrical wiring.

**6. Improvements and Weather Monitoring Equipment.** NSCO shall be solely responsible for the cost and installation of any and all-weather monitoring equipment located in the Weather Monitoring Area. NSCO further agrees that Owner will not be responsible for any costs of damage to the weather monitoring equipment or protective fencing caused by animals, farming operations, or other natural or weather-related causes. Upon the termination of this MOU, NSCO agrees to remove all equipment and support structures at its sole cost and expense.

**7. Removal upon Termination.** The NSCO has 60 days from date of Agreement termination to remove all NSCO owned materials and equipment, if termination occurs between the dates of 1 March and 31 August. If termination occurs between and including the dates of 1 September and 28/29 February, the NSCO has until the next April 30<sup>th</sup> following the termination to remove all NSCO owned materials and equipment. Termination may be in part(s), location specific, in response to ownership changes and would be so reflected per Amendment to this Agreement.

**8. Liabilities.** Each party agrees that the other party shall in no way be responsible for the debts of, or liabilities for accidents or damages caused by the other party.

**9. Inspection.** The NSCO shall have the right to go upon the Premises at reasonable times to inspect or repair the weather monitoring equipment thereon or for any other purpose incidental to the management of the weather monitoring equipment. NSCO agrees to be responsible for closing any gates used for its access to the premises.

**10. Real Property Taxes.** The Owner shall pay the real property taxes for the Premises, if any are owed.

**11. No Partnership Created.** This MOU shall not be deemed to give rise to a partnership relation, and neither party shall have authority to obligate the other without written consent.

**12. No Oral Modifications.** This MOU embodies and includes all the terms and conditions of the agreement between the parties and no statements, representations, promises, agreements or conditions of any character shall be binding upon either party hereto unless embodied in this written MOU. No part of any additions or exceptions to this MOU shall be binding upon the parties unless the same shall be reduced to writing and signed by both parties.

**13. Governing Law.** It is agreed that this Lease shall be governed by, construed, and enforced in accordance with the laws of the State of Nebraska.

**14. Modification.** None of the terms or conditions of this MOU shall be modified without the written consent of the parties, and this MOU contains the entire agreement of the parties.

**15. Binding.** The terms and conditions herein contained shall extend to and be binding upon the successors, assigns, heirs, and personal representatives of the parties to this MOU.

**16. Transfer of Ownership.** Owner agrees to provide NSCO thirty (30) days notice prior to any transfer of ownership of the Premises.



17. **NSCO Notices.** All notices to NSCO under this MOU shall be in writing and sent to:

Dr. Martha Shulski, Director  
Nebraska State Climate Office  
153C Hardin Hall  
University of Nebraska  
Lincoln, NE 68583  
Email: mshulski3@unl.edu

18. **Owner Notices.** All notices to Owner under this MOU shall be in writing and sent to:

Paul Zillig, General Manager  
Lower Platte South Natural Resources District  
3125 Portia Street  
Lincoln, NE 68521  
Email: pzillig@lpsnrd.org

19. **Data and Product Access by Owner.** The NSCO will make data collected from the Weather Monitoring Area, along with all other NSCO Nebraska Mesonet data, available via electronic interface on the Internet. The Owner will have unlimited access to raw and derived data values through a NSCO Web interface. Unlimited data refers to both temporal and spatial relationships of any data in the NSCO database.

IN WITNESS WHEREOF, the authorized representatives of the parties have executed  
this Agreement as of this \_\_\_\_\_ day of \_\_\_\_\_, 2022.

**Full Legal Name of the Owner**

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Printed Name:** \_\_\_\_\_

**Title & Entity:** \_\_\_\_\_

**The Board of Regents of the University of Nebraska/NSCO (the NSCO)**

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Printed Name:** Martha Shulski

**Title & Entity:** Director, Nebraska State Climate Office

**Exhibit B**

**The Premises**

**Premise:**

**In grass area north of access road, at approximately 41.164N, -96.871E, in the SE ¼ of Range 5E, Township 14, Section 20, Saunders County, Nebraska, Saunders County Parcel ID 262500.**




## LOWER PLATTE SOUTH natural resources district

3125 Portia Street | P.O. Box 83581 • Lincoln, Nebraska 68501-3581  
P: 402.476.2729 • F: 402.476.6454 | www.lpsnrd.org

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### Memorandum

**Date:** May 10, 2022  
**To:** Water Resources Subcommittee  
**From:** Dick Ehrman, Water Resources Coordinator   
**Subject:** 2022-2027 Water and Soil Laboratory Services

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In 2005, the District began awarding three-year contracts for ground water and soil analytical services because of the need for consistency and comparability in the data from year-to-year. The contracts were intended to be renewable, subject to quality assurance/quality control (QA/QC) review by staff. For the past decade or more, LPSNRD has utilized Midwest Labs out of Omaha for analytical results, and have found the quality of their work to be very good. In 2017, LPSNRD entered into a five-year contract with Midwest Labs to provide additional consistency and predictability for those costs, and that contract is expiring in the spring of 2022. Midwest Labs has provided LPSNRD with a quote for proposed analytical costs through May 2027 (attached).

The District has monitored the QA/QC of Midwest Labs from 2005-2022 and as mentioned has determined it to be very good—in nearly all cases well within our QA requirements, and in those few cases where anomalous results have been found, Midwest has worked diligently to locate and correct any problems. Midwest's results have been compared to various QA/QC samples the District has analyzed by the Nebraska Department of Health and the University of Nebraska Water Sciences Laboratories, and those results hold up extremely well. In addition, Midwest has worked with LPSNRD field staff to develop a workable and efficient system of sample delivery, cooler and other equipment supply, and data delivery.

In summary, the total percent change for a routine analysis proposed for 2022-2027 from the previous five-year contract was 28%, which is considerably more than the 10.8% increase approved in the 2017-2022 contract renewal. This routine analysis includes the most commonly analyzed constituents of nitrate-nitrogen, major ions, and pesticides. The cost of a routine analysis has changed as follows since 2003:

*Protecting our natural resources for future generations*

<u>Years</u>	<u>Cost of routine analysis</u>	<u>Difference from Previous</u>
2022-2027	\$306.00	28.0%
2017-2022	\$230.67	10.8%
2014-2017	\$206.93	9.2%
2011-2014	\$188.70	8.3%
2008-2011	\$173.55	10.9%
2005-2008	\$155.60	-3.3%
2003	\$160.85	

Although this increase is substantial, given current events such as the COVID pandemic which has resulted in supply chain and staffing issues as well as recent trends in inflation, such an increase is not particularly unexpected. If such an increase is averaged over the entire five years of the proposed contract, the amount becomes more like 5 to 6%, which again is not unusual at present. Therefore, given that Midwest has repeatedly produced high quality results in a timely manner, they are very cooperative and flexible in working with our field crew, and their price increases are not unexpected, staff recommends renewing the Midwest Labs contract for five years from 2022-2027, with changes in the price of services as given in the attached quotation form.

**STAFF RECOMMENDED MOTION**

The Water Resources Subcommittee recommends that the Board of Directors enter into a professional services contract with Midwest Laboratories for the 5-year period of June 1, 2022 to May 31, 2027 for water and soil analyses at the prices given in the attached document, subject to review by legal counsel.

Enclosures

Pc: Water Resources Subcommittee File

April 6th 2022

# Water Analysis Quotation

PREPARED FOR

Lower Platte South NRD -  
Account 8722



13611 B STREET | OMAHA, NE 68144  
402.334.7770 | MIDWESTLABS.COM

**LOWER PLATTE SOUTH NRD - 8722**

Dear Chris Witthuhn,

Midwest Laboratories has provided a formal pricing quotation for the analysis being requested. In the attached document you will find a price per sample for the requested test packages. An administrative fee will also be assessed annually for the reporting and clerical entry required. If any further details are needed please contact me at 402-334-7770 or [kstanek@midwestlabs.com](mailto:kstanek@midwestlabs.com).

If the bid is found acceptable please sign and date the bid acknowledgment form found on the final page.

We look forward to your response.

Sincerely,  
Kerri Stanek  
Account Manager



# Lower Platte South NRD - 8722

## Formal Water Analysis Quotation

Bid Date: 4/6/2022  
 Bid Expiration: 5/31/27  
 Prices Expire: 5/31/27

Matrix	Parameters	Method	#	TAT (Days)	Unit Price	Extended Price
Aqueous	Hardness Dissolved	varies	1	7-10	\$0.00	\$0.00
Aqueous	Hardness Total	varies	1	7-10	\$0.00	\$0.00
Aqueous	EPA 8260	EPA 8260	1	7-10	\$125.00	\$125.00
Aqueous	Arsenic ICP Total	EPA 200.7	1	7-10	\$14.00	\$14.00
Aqueous	Arsenic ICP-MS Total	EPA 200.8	1	7-10	\$16.00	\$16.00
Aqueous	Calcium ICP Total	EPA 200.7	1	7-10	\$10.00	\$10.00
Aqueous	Iron ICP Total	EPA 200.7	1	7-10	\$10.00	\$10.00
Aqueous	Magnesium ICP Total	EPA 200.7	1	7-10	\$10.00	\$10.00
Aqueous	Manganese ICP Total	EPA 200.7	1	7-10	\$10.00	\$10.00
Aqueous	Potassium ICP Total	EPA 200.7	1	7-10	\$10.00	\$10.00
Aqueous	Selenium ICP Total	EPA 200.7	1	7-10	\$14.00	\$14.00
Aqueous	Selenium ICP-MS Total	EPA 200.8	1	7-10	\$16.00	\$16.00
Aqueous	Silicon ICP Total	EPA 200.7	1	7-10	\$14.00	\$14.00
Aqueous	Sodium ICP Total	EPA 200.7	1	7-10	\$10.00	\$10.00
Aqueous	Calcium ICP Dissolved	EPA 200.7	1	7-10	\$10.00	\$10.00
Aqueous	Iron ICP Dissolved	EPA 200.7	1	7-10	\$10.00	\$10.00
Aqueous	Magnesium ICP Dissolved	EPA 200.7	1	7-10	\$10.00	\$10.00
Aqueous	Manganese ICP Dissolved	EPA 200.7	1	7-10	\$10.00	\$10.00
Aqueous	Potassium ICP Dissolved	EPA 200.7	1	7-10	\$10.00	\$10.00
Aqueous	Silicon ICP Dissolved	EPA 200.7	1	7-10	\$14.00	\$14.00
Aqueous	Sodium ICP Dissolved	EPA 200.7	1	7-10	\$10.00	\$10.00
Aqueous	Alkalinity by Titration	SM 2320 B-1997	1	7-10	\$12.00	\$12.00
	Chloride by Ion Chromatography	EPA 300.0	1	7-10	\$12.00	\$12.00
Aqueous	Conductivity	SM 2510 B	1	7-10	\$12.00	\$12.00
Aqueous	Fluoride by Ion Chromatography	EPA 300.0	1	7-10	\$12.00	\$12.00
Aqueous	Nitrate/Nitrite by Cadmium Reduction	EPA 353.2	1	7-10	\$12.00	\$12.00



# Lower Platte South NRD - 8722

## Formal Water Analysis Quotation

Bid Date: 4/6/2022  
 Bid Expiration: 5/31/27  
 Prices Expire: 5/31/27

Matrix	Parameters	Method	#	TAT (Days)	Unit Price	Extended Price
Aqueous	Percent Solids	SM 2540 G	1	5	\$10.00	\$10.00
Aqueous	Sulfate by Ion Chromatography	EPA 300.0	1	5	\$12.00	\$12.00
Aqueous	Total Dissolved Solids	SM 2540 C-1997	1	5	\$16.00	\$16.00
Aqueous	pH	SM 4500-H+ B-2000	1	5	\$10.00	\$10.00
Aqueous	NEP (Neutral Extractable Pesticides)	NEP	1	5	\$150.00	\$150.00
Solid	EPA 8260	EPA 8260	1	5	\$125.00	\$125.00
Solid	Arsenic ICP Total	EPA 6010B	1	5	\$14.00	\$14.00
Solid	Selenium ICP Total	EPA 6010B	1	5	\$14.00	\$14.00
Solid	Selenium ICP-MS Total	EPA 6020	1	5	\$16.00	\$16.00
	Nitrate/Nitrite by Cadmium Reduction	EPA 353.2	1	5	\$12.00	\$12.00
Solid	Percent Solids	SM 2540 G	1	5	\$10.00	\$10.00
Solid	pH	EPA 9045	1	5	\$10.00	\$10.00
Extended Project Price						\$792.00
Administrative Fee <small>Includes initial data entry for all chemical determinations</small>						\$200.00
Approximate Analysis Cost (5 year Estimate)						3,960.00
Extended Estimated (5 year) Project Cost						\$4,960.00

## Lower Platte South NRD - 8722

### Reporting Limits

Method	Analyte	MRL	Units
EPA 8260	Dichlorodifluoromethane	1.00	ug/L
EPA 8260	Chloromethane	1.00	ug/L
EPA 8260	Vinyl chloride	1.00	ug/L
EPA 8260	Bromomethane	1.00	ug/L
EPA 8260	Chloroethane	1.00	ug/L
EPA 8260	Trichlorofluoromethane	1.00	ug/L
EPA 8260	Acrolein	20.0	ug/L
EPA 8260	Acetone	30.0	ug/L
EPA 8260	Ethyl Ether	30.0	ug/L
EPA 8260	1,1-Dichloroethene	1.00	ug/L
EPA 8260	Iodomethane	1.00	ug/L
EPA 8260	Acrylonitrile	20.0	ug/L
EPA 8260	Methylene Chloride	3.00	ug/L
EPA 8260	1,1,2-Trichloro-1,1,2-trifluoroethane	10.0	ug/L
EPA 8260	Allyl Chloride	10.0	ug/L
EPA 8260	Carbon disulfide	1.00	ug/L
EPA 8260	trans-1,2-Dichloroethene	1.00	ug/L
EPA 8260	Methyl tert-Butyl Ether	1.00	ug/L
EPA 8260	1,1-Dichloroethane	1.00	ug/L
EPA 8260	Vinyl acetate	5.00	ug/L
EPA 8260	Chloroprene	5.00	ug/L
EPA 8260	2-Butanone	10.0	ug/L
EPA 8260	cis-1,2-Dichloroethene	1.00	ug/L
EPA 8260	Bromochloromethane	1.00	ug/L
EPA 8260	Chloroform	1.00	ug/L
EPA 8260	2,2-Dichloropropane	1.00	ug/L
EPA 8260	Methyl Acrylate	5.00	ug/L
EPA 8260	Tetrahydrofuran	20.0	ug/L
EPA 8260	1,2-Dichloroethane	1.00	ug/L
EPA 8260	1,1,1-Trichloroethane	1.00	ug/L
EPA 8260	1,1-Dichloropropene	1.00	ug/L
EPA 8260	Carbon Tetrachloride	1.00	ug/L
EPA 8260	Benzene	1.00	ug/L

# Lower Platte South NRD - 8722

## Reporting Limits

Method	Analyte	MRL	Units
EPA 8260	Dibromomethane	1.00	ug/L
EPA 8260	1,2-Dichloropropane	1.00	ug/L
EPA 8260	Trichloroethene	1.00	ug/L
EPA 8260	Bromodichloromethane	1.00	ug/L
EPA 8260	Methyl Methacrylate	5.00	ug/L
EPA 8260	cis-1,3-Dichloropropene	1.00	ug/L
EPA 8260	4-Methyl-2-pentanone	10.0	ug/L
EPA 8260	trans-1,3-Dichloropropene	1.00	ug/L
EPA 8260	1,1,2-Trichloroethane	1.00	ug/L
EPA 8260	Toluene	1.00	ug/L
EPA 8260	1,3-Dichloropropane	1.00	ug/L
EPA 8260	Ethyl Methacrylate	5.00	ug/L
EPA 8260	Dibromochloromethane	1.00	ug/L
EPA 8260	2-Hexanone	10.0	ug/L
EPA 8260	1,2-Dibromoethane	1.00	ug/L
EPA 8260	Tetrachloroethene	1.00	ug/L
EPA 8260	1,1,1,2-Tetrachloroethane	1.00	ug/L
EPA 8260	Chlorobenzene	1.00	ug/L
EPA 8260	Ethylbenzene	1.00	ug/L
EPA 8260	m,p-Xylenes	2.00	ug/L
EPA 8260	Bromoform	1.00	ug/L
EPA 8260	cis-1,4-Dichloro-2-butene	1.00	ug/L
EPA 8260	Styrene	1.00	ug/L
EPA 8260	1,1,2,2-Tetrachloroethane	1.00	ug/L
EPA 8260	o-Xylene	1.00	ug/L
EPA 8260	1,2,3-Trichloropropane	1.00	ug/L
EPA 8260	trans-1,4-Dichloro-2-butene	5.00	ug/L
EPA 8260	Isopropylbenzene	1.00	ug/L
EPA 8260	Bromobenzene	1.00	ug/L
EPA 8260	n-Propyl Benzene	1.00	ug/L
EPA 8260	2-Chlorotoluene	1.00	ug/L
EPA 8260	4-Chlorotoluene	1.00	ug/L
EPA 8260	1,3,5-Trimethylbenzene	1.00	ug/L
EPA 8260	tert-Butylbenzene	1.00	ug/L

## Lower Platte South NRD - 8722

### Reporting Limits

Method	Analyte	MRL	Units
EPA 8260	1,2,4-Trimethylbenzene	1.00	ug/L
EPA 8260	sec-Butylbenzene	1.00	ug/L
EPA 8260	1,3-Dichlorobenzene	1.00	ug/L
EPA 8260	1,4-Dichlorobenzene	1.00	ug/L
EPA 8260	p-Isopropyltoluene	1.00	ug/L
EPA 8260	1,2-Dichlorobenzene	1.00	ug/L
EPA 8260	n-Butyl Benzene	1.00	ug/L
EPA 8260	1,2-Dibromo-3-Chloropropane	1.00	ug/L
EPA 8260	1,2,4-Trichlorobenzene	1.00	ug/L
EPA 8260	Naphthalene	1.00	ug/L
EPA 8260	Hexachlorobutadiene	1.00	ug/L
EPA 8260	1,2,3-Trichlorobenzene	2.00	ug/L
EPA 8260	Total Xylenes	1.00	ug/L

## Lower Platte South NRD - 8722

### Reporting Limits - Total Metals in Aqueous

Method	Analyte	MRL	Units
EPA 200.7	Arsenic	0.1	mg/L
EPA 200.7	Calcium	0.1	mg/L
EPA 200.7	Iron	0.05	mg/L
EPA 200.7	Magnesium	0.1	mg/L
EPA 200.7	Manganese	0.01	mg/L
EPA 200.7	Potassium	0.1	mg/L
EPA 200.7	Selenium	0.1	mg/L
EPA 200.7	Silicon	0.1	mg/L
EPA 200.7	Sodium	0.1	mg/L
EPA 200.8	Arsenic	0.001	mg/L
EPA 200.8	Selenium	0.001	mg/L

### Reporting Limits - Total Metals in Solid

Method	Analyte	MRL	Units
EPA 6010B	Arsenic	0.1	mg/kg dry wt
EPA 6010B	Selenium	0.1	mg/kg dry wt
EPA 6020	Selenium	0.005	mg/kg dry wt

## Lower Platte South NRD - 8722

### Reporting Limits - Dissolved Metals in Aqueous

Method	Analyte	MRL	Units
EPA 200.7	Calcium	0.1	mg/L
EPA 200.7	Iron	0.05	mg/L
EPA 200.7	Magnesium	0.1	mg/L
EPA 200.7	Manganese	0.01	mg/L
EPA 200.7	Potassium	0.1	mg/L
EPA 200.7	Silicon	0.1	mg/L
EPA 200.7	Sodium	0.1	mg/L

### Reporting Limits - Environmental Chemistry in Aqueous

Method	Analyte	MRL	Units
EPA 300.0	Chloride	1.0	mg/L
EPA 300.0	Fluoride	0.1	mg/L
EPA 300.0	Sulfate	1.50	mg/L
EPA 353.2	Nitrate/Nitrite Nitrogen	0.2	mg/L
SM 2320 B-1997	Alkalinity, Total (as CaCO <sub>3</sub> )	20.0	mg/L
SM 2510 B	Specific conductance	2.00	umhos/cm
SM 2540 C-1997	Total Dissolved Solids	10.0	mg/L
SM 2540 G	Percent Solids	0.01	%

### Reporting Limits - Environmental Chemistry in Solid

Method	Analyte	MRL	Units
EPA 353.2	Nitrate/Nitrite Nitrogen	0.2	mg/kg dry wt
EPA 9045	pH		S.U.
SM 2540 G	Percent Solids	0.01	%

## Lower Platte South NRD - 8722

Reporting Limits - Environmental Chemistry (in lab, exceeds regulator hold times) in Aqueous

Method	Analyte	MRL	Units
SM 4500-H+ B-2000	pH		S.U.

### Reporting Limits - Pesticide Screen in Aqueous

Method	Analyte	MRL	Units
NEP	EPTC	0.5	ug/L
NEP	Butylate	0.2	ug/L
NEP	Propachlor	0.5	ug/L
NEP	Deisopropylatrazine	0.5	ug/L
NEP	Desethylatrazine	0.5	ug/L
NEP	Ethalfluralin	0.5	ug/L
NEP	Trifluralin	0.5	ug/L
NEP	Phorate	0.3	ug/L
NEP	Benfluralin	0.3	ug/L
NEP	Simazine	0.5	ug/L
NEP	Prometon	0.5	ug/L
NEP	Atrazine	0.5	ug/L
NEP	Propazine	0.5	ug/L
NEP	Terbufos	0.2	ug/L
NEP	Fonofos	0.5	ug/L
NEP	Triallate	0.5	ug/L
NEP	Metribuzin	0.5	ug/L
NEP	Dimethenamid	0.5	ug/L
NEP	Acetochlor	0.5	ug/L
NEP	Ametryn	0.2	ug/L
NEP	Alachlor	0.5	ug/L
NEP	Prometryn	0.2	ug/L

## Lower Platte South NRD - 8722

### Reporting Limits - Pesticide Screen in Aqueous

Method	Analyte	MRL	Units
NEP	Bromacil	0.2	ug/L
NEP	Cyanazine	0.2	ug/L
NEP	Metolachlor	0.5	ug/L
NEP	Chlorpyrifos	0.5	ug/L
NEP	Pendimethalin	0.5	ug/L
NEP	Isophenphos	0.2	ug/L
NEP	Butachlor	0.2	ug/L
NEP	Oxadiazon	0.4	ug/L





## MIDWEST LABORATORIES FREQUENTLY ASKED QUESTIONS

### GENERAL INFORMATION:

#### Normal Business Hours of Operation

Monday - Friday 8:00-5:00pm (office)

#### Shipping Department Hours

Monday - Friday 7:00-4:00pm (supplies)

### SAMPLES RECEIVED AT MIDWEST LABORATORIES:

SHIP SAMPLES TO: 13611 B STREET OMAHA, NE 68144

Monday- Friday: 8:00-5:00PM

Saturday Morning: USPS Mail, UPS, and FedEx Only

For additional information on our services, please visit our website at [www.midwestlabs.com](http://www.midwestlabs.com) or contact your account manager. We are committed to providing the highest quality service to our clients and are always looking for ways to improve our service.

### SHIPPING

Shipping Labels are available through the MyLab Portal. Midwest Labs offers discounted shipping options for Ground, Overnight, Saturday Delivery, and Next Day Air. Ground shipping labels are available for a \$13.00 flat rate. Shippers include; UPS, FedEx, and Speedee Delivery Services. Not all services are available through all shippers or in all areas. Please contact your local shipper for assistance.

### SUPPLIES:

Midwest Laboratories offers sampling supplies to ease our clients in the sampling process. These include, coolers, boxes, bottles, environmental swabs, and sampling instructions. Soil sampling bags are complimentary to all of our clients and can be ordered through the MyLab Portal or by contacting your account manager. Please contact your account manager for re-occurring supply orders and all customized supply orders/kits.

### INVOICING:

All work reported will be invoiced the first of the month following results; Net30 payment terms

### TRAINING AND FIELD SUPPORT:

Midwest Laboratories is honored to offer unlimited training from our Agronomic Field Team and Account Managers. MyLab Portal training offered by our client onboarding specialist. Call us to schedule.

If you need additional help, contact our Client Services team via email at [contactus@midwestlabs.com](mailto:contactus@midwestlabs.com) or by phone at 402.334.7770



**Lower Platte South  
NRD - 8722**

CHRIS WUTTUHN  
LINCOLN NE

**Formal Analysis Quotation**

**This is to acknowledge that I have received and reviewed a copy of the 2022 Formal Analysis Quotation and agree to proceed with testing for the remaining calendar year April 2022 through May 2027.**

**I acknowledge that the bid proposal identifies a cost per sample and that the terms of the agreement will be reviewed annually.**

**By signing this acknowledgment, I am agreeing to submit samples to Midwest Laboratories beginning the \_\_\_\_\_ day of \_\_\_\_\_ 2022.**

**Account Number: 8722**

**Date: \_\_\_\_\_**

**Contact Name \_\_\_\_\_**

**Company Name \_\_\_\_\_**

**Signature \_\_\_\_\_**

**To be returned to Kayla Simms, at [ksimms@midwestlabs.com](mailto:ksimms@midwestlabs.com), Director of Brand and Business Development to signify your acceptance of the proposed bid.**

**Midwest Laboratories will honor all pricing from  
April 6th 2022 through May 31st 2027**

## Memorandum

**Date:** May 10, 2022  
**To:** WRS Sub-Committee Lower Platte South NRD  
**From:** Mike Murren, Projects Coordinator  
**Subject:** Vergith-Fulton Driveway agreement

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The US3-A project is moving close to the finish line. One of the last items we need to closeout this project is to approve an Agreement Release and Waiver between Lylester Ranch LLC/Dan and Patricia Vergith and Fulton Construction/Steve Fulton and the LPSNRD.

This agreement ties together two previously approved actions involving the driveway at Vergith's residence. The first agreement was an MOU approved by the board on November 20<sup>th</sup>, 2019, that spells out how the compensation that we will pay due to the landowner's inability to use his driveway during the construction period and the second agreement was approved by the board in April 2000 with Steve Fulton of Fulton construction to replace the Vergith driveway to pre-construction status.

The attached agreement has been prepared by legal counsel and been sent to both Steve Fulton and Dan Vergith for there review. We will need a recommendation to allow the general manger to sign this agreement and make payment to Dan and Patricia Vergith in the amount of \$27,505 to compensate for damages due to the Upper Salt 3-A dam Rehabilitation project.

Enc. Agreement, Release, and Waiver

Vergith MOU

Fulton Construction Bid

**DRAFT**

**AGREEMENT, RELEASE, AND WAIVER**

This Agreement, Release, and Waiver is entered into this \_\_\_\_ day of \_\_\_\_\_ 2022, by and between Lylester Ranch, LLC, a Nevada Limited Liability Company, hereafter referred to as the "Landowner", Fulton Construction, Inc., hereinafter referred to as the "Contractor", and the Lower Platte South Natural Resources District, a Political Subdivision of the State of Nebraska, hereafter referred to as the "District" (collectively referred to herein as the "Parties").

**RECITALS**

WHEREAS, in 2019, the District began the rehabilitation project to Upper Salt 3-A Dam ("Project"); and

WHEREAS, the District and the Landowner had entered into a Memorandum of Understanding, dated November 20, 2019, ("MOU"), relating to the temporary road closure of Stagecoach Road and the temporary closure of the hard surfaced and gated east entrance of the Landowner's property as a result of the Project; and

WHEREAS, in the MOU the District agreed to remove the Landowner's driveway, fencing, electrical wiring, and gate, and restore said components to a level that would be comparable with their state prior to removal; and

WHEREAS, the Landowner desires to make improvements to its driveway, fencing, electrical wiring, and gate beyond the restoration originally contemplated by the District and the Landowner under the MOU; and

WHEREAS, the Landowner has engaged with the Contractor to complete said improvements; and

WHEREAS, the District has agreed to pay a total of \$24,505.00 toward the costs of removing and replacing Landowner's original driveway, fencing, electrical wiring, and gate, pursuant to a proposal from Contractor, dated April 6, 2020 ("Proposal"); and

WHEREAS, the Contractor has completed the work to remove the Landowner's original driveway, fence, and gate, and the Contractor has regraded the area and begun constructing a new entry structure; and

WHEREAS, the Landowner has hired the Contractor to perform additional work to improve Landowner's property beyond the scope of work under the MOU, which work shall be performed at Landowner's cost; and

WHEREAS, the Contractor has yet to complete all the work to improve Landowner's property under the Proposal; and

WHEREAS, the construction of the Project was completed on November 22, 2021, and Stagecoach Road has been re-opened; and

WHEREAS, the District desires to finalize all matters related to the Project, including making all payments the District owes under the MOU and the Proposal; and

WHEREAS, the Parties desire to settle any and all claims which involve the District and are in any way connected to the Project, including, but not limited to, all claims relating to the MOU, the Proposal, and any other claims for monetary compensation or damages relating to the Project, whether based in contract, inverse condemnation, or any other theory.

NOW, THEREFORE, in consideration of the above Recitals and the mutual promises and covenants contained herein, the Parties agree as follows:

**A. The Landowner:**

1. The Landowner will complete and direct at its discretion all remaining work to be performed under the MOU and the Proposal, including but not limited to constructing east driveway, re-establishing main access back to east driveway, and relocating mailbox and all other prior services.
2. The Landowner will pay the Contractor for all amounts owed relating to work already completed under the MOU and the Proposal, work that has yet to be completed under the MOU and the Proposal, and for work relating to improvements to Landowner's property beyond the scope of the MOU and the Proposal.
3. The Landowner will accept payment from the District, as provided below, and does hereby release the District and each of its directors, agents, employees, representatives, successors and assigns from any and all claims and causes of action the Landowner may have against the District regarding the Project, including, but not limited to, all claims relating to the MOU, the Proposal, and any other claims for monetary compensation or damages relating to the Project, whether based in contract, inverse condemnation, or any other theory.

**B. The Contractor:**

1. The Contractor will contract with and follow direction from the Landowner regarding all remaining work to be performed under the MOU and the Proposal, including but not limited to constructing east driveway, re-establishing main access back to east driveway, relocating mailbox and all other prior services.
2. The Contractor will accept payment from the Landowner for all amounts owed relating to work already completed under the MOU and the Proposal, work that has yet to be completed under the MOU and the Proposal, and for work relating to improvements to Landowner's property beyond the scope of the MOU and the Proposal.

3. The Contractor will, and by executing this document hereby does, accept the benefit of the District's payment to Landowner, as provided below, and the promised payment from Landowner, as provided above, and release the District and each of its directors, agents, employees, representatives, successors and assigns from any and all claims relating to the MOU, the Proposal, and any other claims for monetary compensation or damages relating to the Project, whether based in contract or any other theory.

C. The District:

1. The District will pay to the Landowner Twenty-Four Thousand Five Hundred and Five Dollars (\$24,505.00), which is to be used by the Landowner to pay all amounts owed relating to work already completed under the MOU and the Proposal, work that has yet to be completed under the MOU and the Proposal, and for work relating to improvements to Landowner's property beyond the scope of the MOU and the Proposal.
2. The District will pay to the Landowner Three Thousand Dollars (\$3,000.00) for the inconvenience caused by the use of a temporary access and delivery of mail to an alternate location, even though the driveway contemplated by the MOU is not yet completed.

IN WITNESS WHEREOF, the Parties have executed the Agreement, Release and Waiver by their duly authorized representatives.

LYLESTER RANCH, LLC

BY:

\_\_\_\_\_  
Daniel Vergith, Manager and Member

\_\_\_\_\_  
(Date)

\_\_\_\_\_  
Patrica Vergith, Member

\_\_\_\_\_  
(Date)

FULTON CONSTRUCTION, INC.

BY:

\_\_\_\_\_  
Steve Fulton, President

\_\_\_\_\_  
(Date)

LOWER PLATTE SOUTH NATURAL  
RESOURCES DISTRICT

BY:

\_\_\_\_\_  
Paul D. Zillig, General Manager

\_\_\_\_\_  
(Date)

## MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding ("MOU") is entered into this 20<sup>th</sup> day of November 2019, by and between Lylester Ranch LLC, a Nevada Limited Liability Company, hereafter referred to as the "Landowner", and the Lower Platte South Natural Resources District, a Political Subdivision of the State of Nebraska, hereafter referred to as the "District" (collectively referred to herein as the "Parties").

### RECITALS

WHEREAS, The District has previously obtained a permanent easement from the Landowner over a tract of land composed of a portion of Lot 26, Irregular Tract, located in the Northeast Quarter of Section 3, Township 7 North, Range 6 East of the 6<sup>th</sup> P.M, Lancaster County, Nebraska, for the operation and maintenance of a dam and flood pool; (the "Property") and

WHEREAS, on June 13, 2019, after an appraisal and negotiations between the Parties, the Landowner granted the District an additional permanent easement and a temporary construction easement over the Property, both for the Rehabilitation of the existing dam and flood pool. The Rehabilitation is referred to as the Upper Salt 3-A project ("Project") or the ("Rehabilitation"); and

WHEREAS; part of the appraisal was based on the removal and replacement by the District of any items located in the temporary easement area that interfered with the construction and access, including the Landowner's security gate, fence and segment of hard surface driveway; and

WHEREAS; the construction of the Project will require temporary road closure of Stagecoach Road and temporary closure of the hard surfaced and gated east entrance to Landowner's property called Lylester Ranch located at 355 W. Stagecoach Road, Martell, NE; and

WHEREAS; the Parties at this time wish to identify and agree upon how certain items affected by the temporary road closure and the Project improvements will be completed and implemented.

NOW, THEREFORE, in consideration of the above Recitals and the mutual promises and covenants contained herein, the Parties agree as follows:

A. The Landowner will:

1. Abide by all provisions set forth in the prior easement and the additional easements granted by the Landowner for the dam structure, flood pool, temporary construction and Rehabilitation.
2. Utilize another existing access to the Lylester Ranch, located at the west end (655 W Stagecoach Rd, Martell, NE) during the construction

phase of the Project, as shown on Exhibit "A-1" attached hereto or until the access drive at its present location is reconstructed and opened for travel.

**B. The District will:**

1. Abide by all provisions set forth in the prior easement and the additional easements granted by the Landowner to the District for the dam structure, flood pool, temporary construction and Rehabilitation.
2. Remove trees within the road right-of-way and in the temporary easement area as shown on Exhibit "A-2" that interfere with the construction and maintenance of the Project and further to save trees, if possible, within the landscaped berm area.
3. Remove the existing driveway culvert within the right-of-way and replace in a new location during construction.
4. Remove the hard surfaced driveway within the temporary easement area as shown on Exhibit "A-2." After the Project is completed, replace the hard surfacing with asphalt paving to thickness and width as was present before removal.
5. Improve grading after driveway is replaced, if needed, for proper drainage to existing berms.
6. Remove and salvage the existing and replace security gate, fencing and related electrical components in driveway area, as shown on Exhibits "A-2" and "A-3", and replacement such items after completion of construction.
7. Coordinate with Landowner the replacement of any electrical lighting, alarms, gate power, intercom, and other electrical equipment removed for the Project located in the driveway area of the Temporary Construction Easement.
8. Relocate Landowner's rural mailbox to a temporary access located at 655 Stagecoach Rd., as shown on Exhibit "A-1" and return the mailbox to its original location when Project is completed.
9. Agree to compensate Landowner for trees damaged or removed within the landscape berm area as shown on Exhibit "A-2".



10. Place rock or riprap, if needed, at points in the drainage area along the dam that are subject to erosion as shown on Exhibit "A-2".
11. Agree to compensate the Landowner Three Thousand Dollars (\$3,000.00) at the completion of the Project for the inconvenience caused by the use of a temporary access and delivery of mail to an alternate location.

IN WITNESS WHEREOF, the Parties have executed the MOU by their duly authorized representatives.

LYLESTER RANCH, LLC

BY:

  
Daniel Vergith, Manager and Member

12/3/19  
(Date)

LOWER PLATTE SOUTH NATURAL  
RESOURCES DISTRICT,

BY:

  
Paul D. Zillig, General Manager

Dec 11, 2019  
(Date)



**Dan & Patricia Vergith/NRD  
355 W. Stagecoach Rd**

RE: Entry Gate 6-Apr-20

Remove 560 sq. ft. of existing driveway and replace with 5" concrete (current location)	\$ 4,690.00
Remove reinstall gate, sensors, replace operator	\$ 12,830.00
Electrical/Phone wiring	\$ 1,000.00
Remove and replace 85 LF of split rail fence at west of drive and 165 LF east of drive	\$ 5,985.00
	\$ 24,505.00

*Culvert replacement is not included*

*Bid assumes new driveway is built up to final grade elevation*

This proposal and pricing is good through September 30, 2020

Terms: 2 Payments of \$12,252.50

First payment due when project is 50% complete, final payment due upon project completion

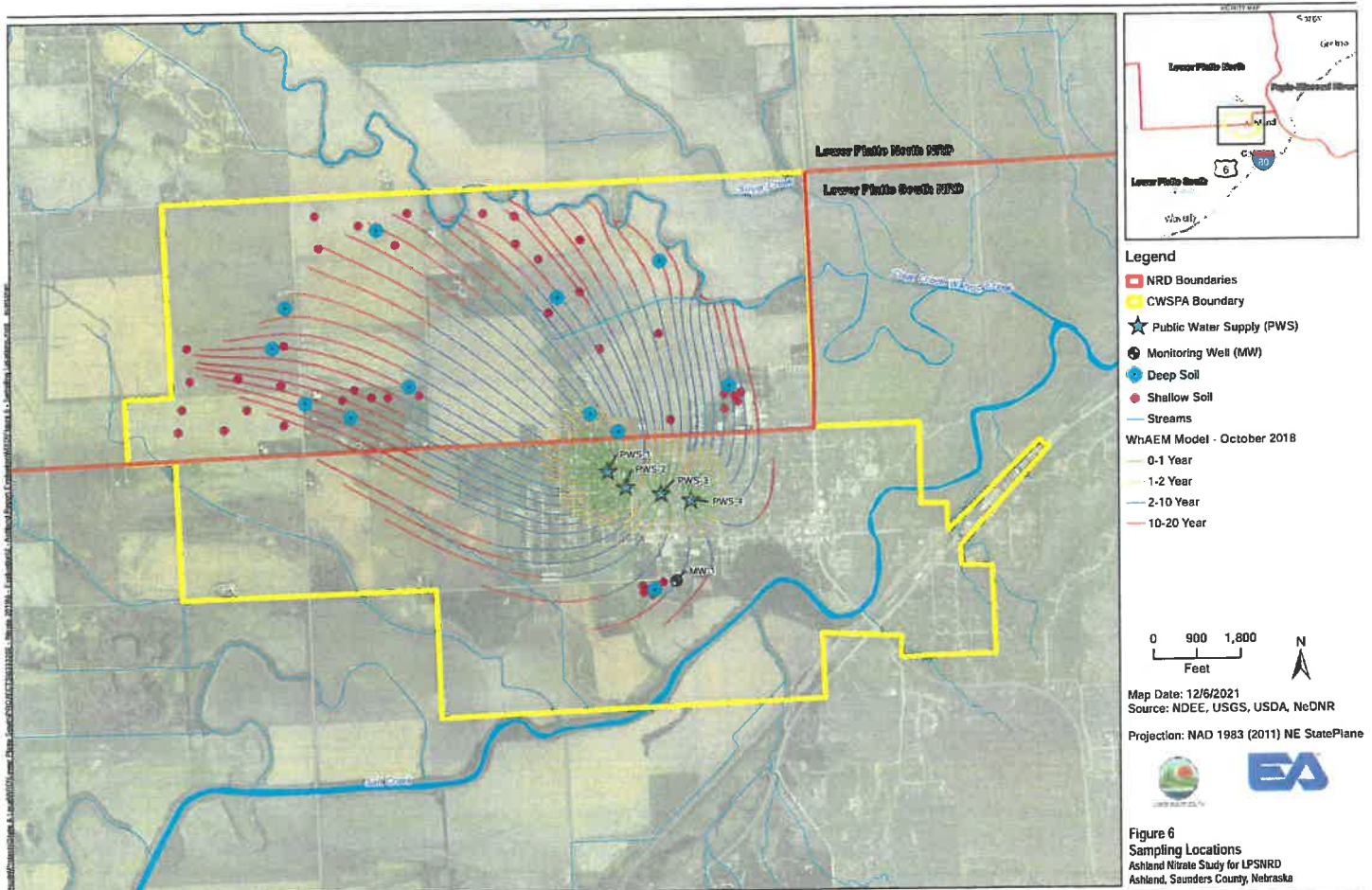
Signed this \_\_\_\_\_ day of April, 2020

\_\_\_\_\_  
Dan Vergith Date

\_\_\_\_\_  
Patricia Vergith Date

Paul Zilig, General Manager NRD

# Phase II Nitrate Verification Study For Ashland Community Water System Protection Area Ashland, Nebraska



## EXECUTIVE SUMMARY

### Background and Purpose

This report has been prepared by EA Engineering, Science, and Technology, Inc., PBC (EA) to document the results of the nitrate-N verification study for the Ashland, Nebraska Community Water System Protection Area (CWSPA), which is supplied by groundwater from four public water supply wells. The purpose of this study was to identify the source and extent of the reported nitrate-N within the Ashland CWSPA. The Lower Platte South Natural Resources District (LPSNRD) requires that the source of nitrate-N be verified as non-point sources before a Phase II nitrogen management area is declared. The LPSNRD is leading the investigation, with support from Lower Platte North Natural Resources District (LPNNRD).

### Field Activities and Results

Field activities were completed from 16 November 2020 through 13 December 2020. Field activities included installation of a monitoring well; collection of 199 shallow soil samples at 8 sites; and collection of 76 deep soil samples at 12 sites.

The deep soil sampling and groundwater results suggest that widespread elevated nitrate-N levels exist in the soil profiles and in the groundwater.

### Sources of Nitrate

The results generally indicate that the source of nitrate-N in groundwater across the CWSPA is likely due to application of commercial fertilizer or manure on cropland. No evidence of point sources such as industrial processes, leakage from an industrial or municipal wastewater site, or large spills were identified within the Ashland CWSPA. One area that is inconclusive is the area surrounding Site 021. Additional investigation would be needed to determine if the source of nitrate-N is from a point source or from non-point source.

Future leaching of nitrate-N through the vadose zone is anticipated. Changes to management practices have potential to reduce the addition of future nitrate loading to the vadose zone. It is recommended that the future sampling results from the monitoring wells be evaluated for trends.

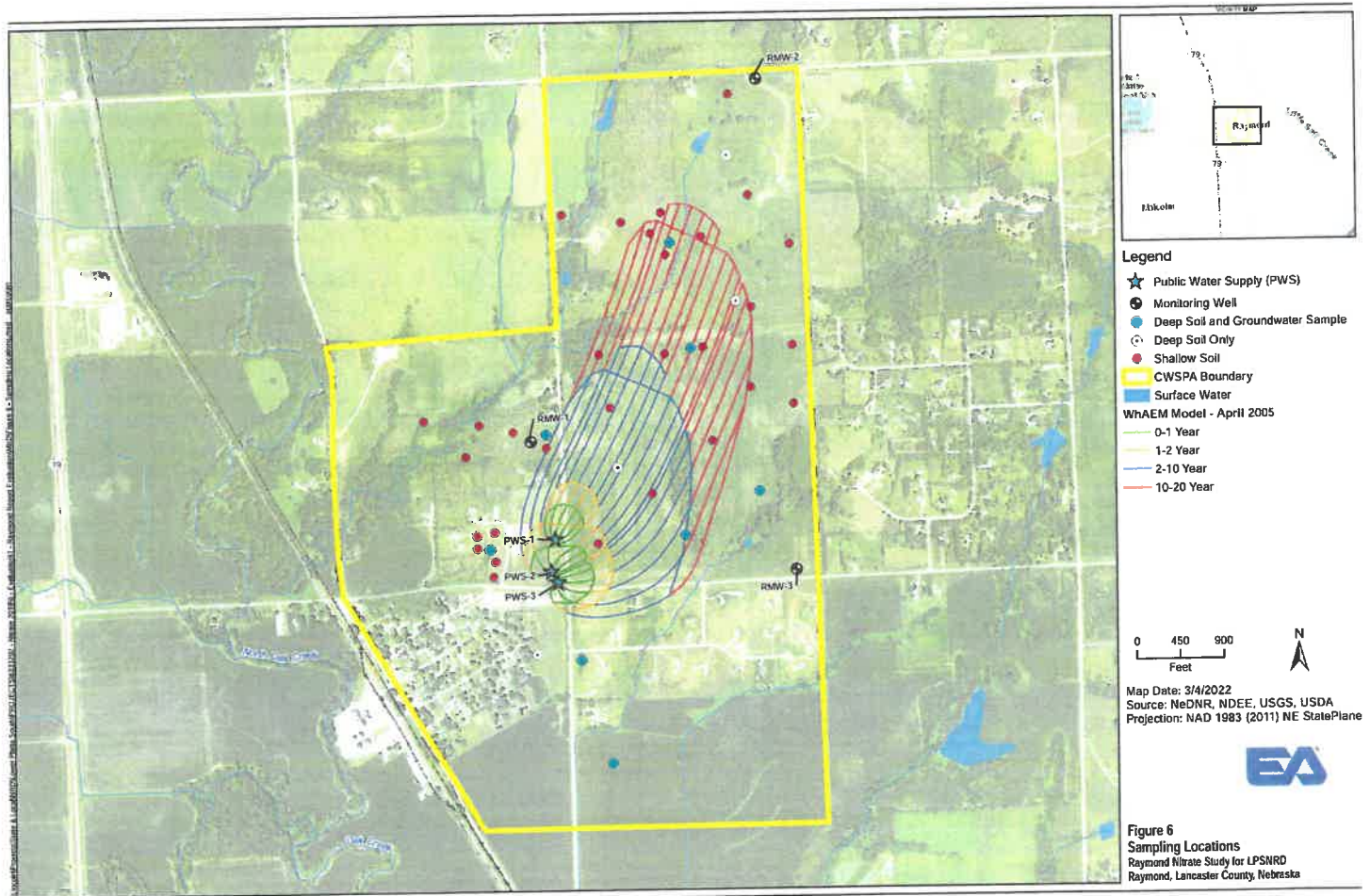
### Data Gaps

A data gap was identified regarding the area northwest of the Ashland CWSPA. A point source cannot be ruled out for the high levels of nitrate-N in groundwater at one site south of the intersection of County Road A and County Road 6. Additional investigation would be needed to determine if the source of nitrate-N is from a point source or from non-point source.

The sparsity of data in this area renders the results inconclusive. It was decided to document the findings of the current field activities and allow the LPSNRD to review the data and decide if additional investigation was desired.

The study included the installation of one monitoring well. Typically, three monitoring wells would be installed to better characterize groundwater elevations, nitrate concentrations in the aquifer, and provide long term nitrate data. Two future monitoring well locations have been identified; but the LPSNRD decided to postpone the installation due to site constraints. The remaining two monitoring wells are projected to be installed in 2023.

# Phase II Nitrate Verification Study For Raymond Community Water System Protection Area Raymond, Nebraska



## EXECUTIVE SUMMARY

### Background and Purpose

This report has been prepared by EA Engineering, Science, and Technology, Inc. (EA) to document the results of the nitrate-N verification study for the Raymond, Nebraska Community Water System Protection Area (CWSPA), which is supplied by groundwater from three public water supply wells. The purpose of this study was to identify the source and extent of the reported nitrate-N within the Raymond CWSPA. The Lower Platte South Natural Resources District (LPSNRD) requires that the source of nitrate-N be verified as non-point sources before a Phase II nitrogen management area is declared.

### Field Activities and Results

Field activities included installation of three monitoring wells; collection of 149 shallow soil samples at 6 sites; and collection of 101 deep soil samples at 12 sites. Sampling activities were completed from 16 November 2020 through 13 December 2020 and monitoring well installation was completed from 26 October 2021 through 1 December 2021.

The deep soil sampling and groundwater results suggest that elevated nitrate-N levels exist in the soil profiles and in the groundwater.

### Sources of Nitrate

The results generally indicate that the source of nitrate-N in groundwater across the CWSPA is likely due to application of commercial fertilizer or manure on cropland. The soil sampling results indicate that dryland corn and soybean sites had nitrate-N values that typically exceeded background nitrate-N concentrations and appear to be a non-point source of nitrate loading. The vadose zone soil nitrate-N levels were found to be generally close to background levels through most of the profile for sites where the land use was range, pasture, or grass. No evidence of point sources such as industrial processes, leakage from an industrial or municipal wastewater site, or large spills were identified within the Raymond CWSPA. One area that is inconclusive is the area surrounding Site 010. Additional investigation would be needed to determine if the source of nitrate-N is from a point source or from non-point source.

Future leaching of nitrate-N through the vadose zone is anticipated. Changes to management practices have potential to reduce the addition of future nitrate loading to the vadose zone. It is recommended that the future sampling results from the monitoring wells be evaluated for trends.

### Data Gaps

A data gap was identified regarding the area east of the Village of Raymond directly southwest of the municipal wells. A point source cannot be ruled out for the high levels of nitrate-N in groundwater at one site southeast of the intersection of NW 40<sup>th</sup> St and Raymond Road. Additional investigation would be needed to determine if the source of nitrate-N is from a point

source or from non-point source. The sparsity of data in this area renders the results inconclusive. This data gap was identified after field activities were complete. It was decided to document the findings of the current field activities and allow the LPSNRD to review the data and decide if additional investigation was desired.